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| 09/651,181 | 08/30/2000 | Todd A. Dickinson | A-68392-2/DJB/RMS/DCF | 2424 |

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| EXAMINER |
|---|
| CHAKRABARTI, ARUN K |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1634 | 10 |

DATE MAILED: 08/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/651,181 | DICKINSON ET AL. | |
| | Examiner | Art Unit | |
| | Frank Lu | 1634 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 June 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10 and 29-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 29-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action* .

## DETAILED ACTION

### *Election/Restriction*

1. Applicant's election without traverse of claims 1-10, 17-24, and 29-31 in Paper No. 9 is acknowledged.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-8, 10, and 29-31 are rejected under 35 U.S.C. 102(a) as being anticipated by Barker et al. (Analytical Chemistry, (1998), Vol. 70, pages 4902-4906).

Barker et al teach a composition comprising:

a) a substrate with a surface comprising discrete sites;

b) a reflective coating on the surface; and

c) a population of microspheres distributed on the substrate, the microspheres comprising at least a first and a second subpopulation (Abstract and Experimental Section, Sensor Preparation and Optical Apparatus for fluorescence and absorbance spectroscopies subsection).

Barker et al teach a composition wherein at least one subpopulation comprises a bioactive agent (Figure 6 and Table 2).

Barker et al teach a composition, wherein the substrate comprises a first and a second surface, wherein the first surface comprises the discrete sites, the reflective coating on the second surface, the population of microspheres distributed on the first surface (Abstract and Experimental Section, Sensor Preparation Subsection ).

Barker et al teach a composition, wherein the substrate is a fiber optic bundle (Abstract and Experimental Section, Sensor Preparation and Optical Apparatus for fluorescence and absorbance spectroscopies subsection).

Barker et al teach a composition, wherein the fiber optic bundle comprises wells comprising the microspheres (Abstract and Experimental Section, Sensor Preparation and Optical Apparatus for fluorescence and absorbance spectroscopies subsection).

Barker et al teach a composition, wherein the substrate is selected from plastic (Sensor Preparation Subsection).

Barker et al teach a composition, wherein the reflective coating is a metal (Abstract and Sensor Preparation Subsection under Experimental Section ).

Barker et al teach a composition, wherein the metal is gold (Abstract and Sensor Preparation Subsection under Experimental Section).

Barker et al teach a composition, wherein the reflective coating selectively absorbs certain wavelengths (Abstract and Sensor Preparation Subsection under Experimental Section and Figures 1-4).

Barker et al teach an array composition comprising:

a) a substrate with a surface comprising discrete sites (Abstract and Sensor Preparation Subsection under Experimental Section);

b) a population of microspheres distributed on the substrate, wherein the microsphere comprise:

I) a bioactive agent; and

ii) a signal transducer element which is a nucleotide intercalator as well as a fluorophore (Abstract and Experimental Section, Sensor Preparation Subsection and optical apparatus for fluorescence and absorbance spectroscopies subsection).

> 4. (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 17-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Walt et al. (U.S. Patent 6,023,540) (February 8, 2000).

Walt et al teach an array composition comprising a substrate with a surface comprising discrete sites comprising alternatively shaped wells (Figures 5A-5B and 7A-7B and Claim 57).

Walt et al teach an array composition, wherein the wall angle is of the alternatively shaped wells is a sloped wall angle (Figures 5A-5B and 7A-7B).

Walt et al teach an array composition,wherein the alternatively shaped wells contain a rounded wall interior (Figures 5A-5B and 7A-7B).

Walt et al teach an array composition, wherein at least one of the alternatively shaped wells is a geometrically shaped well having a cross section selected from a square, a hexagon, a star, a triangle, a pentagon, and a octagon (Figures 5A-5B and 7A-7B).

Walt et al teach an array composition, further comprising a population of microspheres distributed in the wells (Figure 6).

Walt et al teach an array composition, wherein the population comprises at least first and second subpopulation, each of the subpopulations comprising a bioactive agent (Column 4, lines 10-14 and Column 8, line 65 to Column 11, line 25 and Claim 39).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CAR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 24 is rejected under 35 U.S.C. 103(a) over Walt et al. (U.S. Patent 6,023,540) (February 8, 2000) in view of Barker et al. (Analytical Chemistry, (1998), Vol. 70, pages 4902-4906).

Walt et al teach a composition of claims 17-23 as described above.

Walt et al do not teach a composition, wherein the substrate is a transparent substrate comprising a first and a second surface, the first surface comprising discrete sites, and a reflective coating on the second surface.

Barker et al. teach a composition, wherein the substrate is a transparent substrate comprising a first and a second surface, the first surface comprising discrete sites, and a reflective coating on the second surface (Abstract and Experimental Section, Sensor Preparation and Optical Apparatus for fluorescence and absorbance spectroscopies subsection).

It would have been further *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute a composition, wherein the substrate is a transparent substrate comprising a first and a second surface, the first surface comprising discrete sites, and a reflective coating on the second surface of Barker et al. into the composition of Walt et al, since Barker et al. state, "The new fluorescein derivative chemical sensors have characteristics similar to those of the protein-based biosensors, including fast response times, excellent selectivity, and complete reversibility. In addition, the chemical sensors have advantages such as greater stability and commercially available components (Abstract, lines 12-17). ". By employing scientific reasoning, an ordinary artisan would have combined and substituted a composition, wherein the substrate is a transparent substrate comprising a first and a second surface, the first surface comprising discrete sites, and a reflective coating on the second surface of Barker et al. into the composition of Walt et al, in order to improve the synthesis of array of biomolecules. An ordinary practitioner would have been motivated to combine and substitute a composition, wherein the substrate is a transparent substrate comprising a first and a second surface, the first surface comprising discrete sites, and a reflective coating on the second surface of Barker et al. into the composition of Walt et al, in order to achieve the express advantages , as noted by Barker et al., of an invention which provides greater stability and commercially available components in addition to fast response times, excellent selectivity, and complete reversibility.

8. Claim 9 is rejected under 35 U.S.C. 103(a) over Barker et al. (Analytical Chemistry, (1998), Vol. 70, pages 4902-4906) in view of Toriumi et al. (U.S. Patent 5,896,227) (April 20, 1999).

Barker et al teach a composition of claims 1-8, 10, and 29-31 as described above.

Barker et al do not teach a composition, wherein the reflective coating is a dielectric coating.

Toriumi et al teach a composition, wherein the reflective coating is a dielectric coating (Column 7, lines 42-45 and lines 50-52).

It would have been further *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute a composition, wherein the reflective coating is a dielectric coating of Toriumi et al. into the method of Barker et al, since Toriumi et al. state, "Preferably the microspheres have a reflective coating on a portion thereof, e.g., a hemispheric coating of aluminum, silver or a dielectric coating. Such microspheres will be self-retroflecting (Column 7, lines 42-45). ". By employing scientific reasoning, an ordinary artisan would have combined and substituted a composition, wherein the reflective coating is a dielectric coating of Toriumi et al. into the method of Barker et al, in order to improve the synthesis of array of biomolecules. An ordinary practitioner would have been motivated to combine and substitute a composition, wherein the reflective coating is a dielectric coating of Toriumi et al. into the method of Barker et al in order to achieve the express advantages , as noted by Toriumi et al., of an invention which provides microspheres which are self-retroflecting.

9. Claims 1-10, 24, and 29-31 are rejected under 35 U.S.C. 103(a) over Walt et al. (U.S. Patent 6,023,540) (February 8, 2000) in view of Toriumi et al. (U.S. Patent 5,896,227) (April 20, 1999).

Walt et al. teach a composition comprising:

a) a substrate with a surface comprising discrete sites;

; and

c) a population of microspheres distributed on the substrate, the microspheres comprising at least a first and a second subpopulation (Abstract and Column 4, lines 10-14 and Column 8, line 65 to Column 11, line 25 and Claim 39 and Figures 5-7).

Walt et al teach a composition wherein at least one subpopulation comprises a bioactive agent (Column 4, lines 10-14 and Column 8, line 65 to Column 11, line 25 and Claim 39).

Walt et al teach a composition, wherein the substrate comprises a first and a second surface, wherein the first surface comprises the discrete sites, the population of microspheres distributed on the first surface (Column 4, lines 10-14 and Column 8, line 65 to Column 11, line 25 and Claim 39 and Figures 5-7 ).

Walt et al teach a composition, wherein the substrate is a fiber optic bundle (Abstract and Figure 6).

Walt et al teach a composition, wherein the fiber optic bundle comprises wells comprising the microspheres (Figures 4-6 and Column 12, line to Column 13, line 21).

Walt et al teach a composition, wherein the substrate is selected from plastic (Column 5, lines 29-39).

Walt et al teach an array composition comprising:

a) a substrate with a surface comprising discrete sites ();

b) a population of microspheres distributed on the substrate, wherein the microsphere comprise:

I) a bioactive agent; and

ii) a signal transducer element which is a nucleotide intercalator as well as a fluorophore (Column 4, lines 10-14 and Column 8, line 65 to Column 11, line 25 and Claim 39 and Figures 5-7).

Walt et al do not teach a composition, wherein the reflective coating is a metal.

Toriumi et al teach a composition, wherein the reflective coating is a metal silver (Column 7, lines 42-45 and lines 50-52).

Walt et al do not teach a composition, wherein the reflective coating selectively absorbs certain wavelengths.

Toriumi et al inherently teach a composition,wherein the reflective coating selectively absorbs certain wavelengths (Column 7, lines 42-45 and lines 50-52 and Figure 2)

Walt et al do not teach a composition comprising a reflective dielectric coating on the surface.

Toriumi et al teach a composition, wherein the reflective coating is a dielectric coating (Column 7, lines 42-45 and lines 50-52).

It would have been further *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute a composition, wherein the reflective coating is a metal or dielectric coating of Toriumi et al. into the method of Walt et al, since Toriumi et al. state, "Preferably the microspheres have a reflective coating on a portion thereof, e.g., a hemispheric coating of aluminum, silver or a dielectric coating. Such microspheres will be self-retroflecting (Column 7, lines 42-45). " Moreover Walt et al state, "A microsphere-based analytic chemistry system is disclosed in which microspheres carrying different chemical functionalities may be mixed together while the ability is retained to identify the functionality on each bead using an optically interrogatable encoding scheme (Abstract, first sentence)". By employing scientific reasoning, an ordinary artisan would have combined and substituted a composition, wherein the reflective coating is a dielectric coating of Toriumi et al. into the method of Walt et al, in order to improve the synthesis of array of biomolecules. An ordinary practitioner would have been motivated to combine and substitute a composition, wherein the reflective coating is a dielectric coating of Toriumi et al. into the method of Walt et al in order to achieve the express advantages , as noted by Toriumi et al., of an invention which provides microspheres which are self-retroflecting and also to achieve the express advantages, as noted by Walt et al., of a system which provides a microsphere-based analytic chemistry system in which microspheres carrying different chemical functionalities may be mixed together while the ability

is retained to identify the functionality on each bead using an optically interrogatable encoding scheme.

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun Chakrabarti, Ph.D. whose telephone number is (703) 306-5818.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached on (703) 308-1152.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group analyst Chantae Dessau whose telephone number is (703) 605-1237.

Papers related to this application may be submitted to Technology Center 1600 by facsimile transmission via the P.T.O. Fax Center located in Crystal Mall 1. The CM1 Fax Center numbers for Technology Center 1600 are either (703) 305-3014 or (703) 308-4242. Please note that the faxing of such papers must conform with the Notice to Comply published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Arun Chakrabarti
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July 8, 2002

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